

## **CW-EPR characterization of graphene oxide (GO) for biomedical applications**

Laura TORRIERI DI TULLIO - *Istituto Superiore di sanità*

The field of contrast agent (CA) chemistry for magnetic resonance imaging (MRI) applications is currently active, and recent work has demonstrated that GO-based (graphene oxide) CA has valuable properties for both diagnostic and therapeutic applications. The GO is diamagnetic, but if defects are present, it becomes paramagnetic, making it a good candidate as a contrast agent for MRI. Highly purified GO nanosheets were synthesized and X-band CW-EPR was used to detect paramagnetic dangling bonds (DB), Mn and Fe impurities embedded in the GO samples, to understand their role in GO relaxivities. EPR spectra of solid GO show: a small amount of MnII with the typical 6-line hyperfine multiplet, and carbon radicals, attributed to defects in GO nanosheets (DB), with a single narrow line with  $g=2.0031$ . This study aims to gain insight into the relaxation mechanisms of GO-in-water, which is a useful step to better design new GO-based contrast agents for MRI.